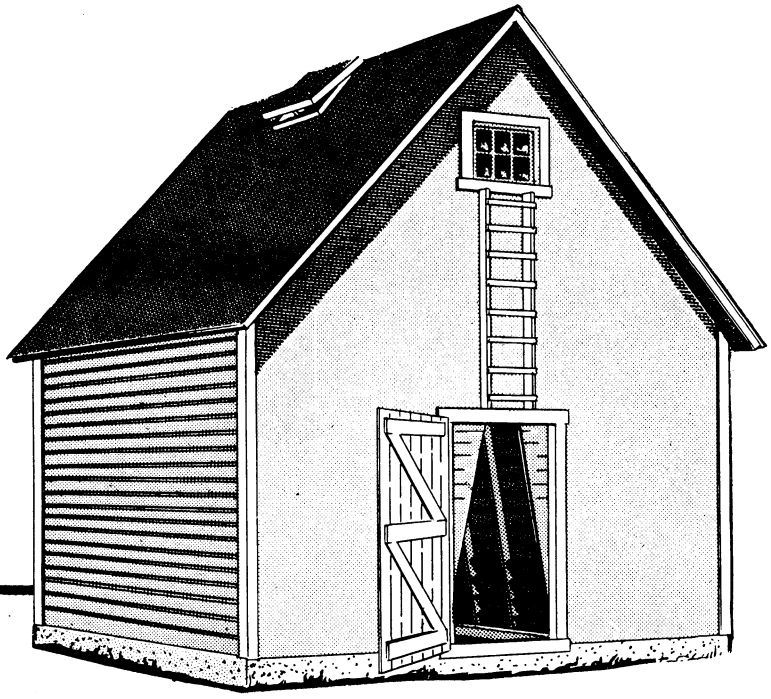
Storage of EAR CORN on the Farm in the North Central States



Farmers' Bulletin No. 2076

U. S. DEPARTMENT OF AGRICULTURE

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Storage of EAR CORN on the Farm in the North Central States

By C. K. SHEDD, *formerly senior agricultural engineer, Agricultural Engineering Research Branch, Agricultural Research Service*[1]

Corn differs from other grain crops in being nearly always too damp to store in a tight bin when harvested. It normally requires further curing after harvest.

Various types of cribs vented for air circulation provide storage for ear corn while the necessary additional curing takes place. Rectangular wood-framed cribs with slatted sides have been in use for many years. Other types of cribs built of such materials as wire mesh and poles, perforated metal, open building tile, and concrete staves are becoming more widely used either for temporary or permanent storage structures. Many cribs are now equipped to dry ear corn mechanically.

Crib storage has some disadvantages. In northern areas there is usually some drifting of snow on top of the corn and into the spaces between the ears in winter storms. If the corn is left in the crib after it is once dry, it will regain moisture from the air in periods of damp weather.

Another disadvantage of crib storage is the difficulty in excluding rats and mice. No ordinary construction will keep out all of these vermin.

Corn in a crib is also exposed to insect infestation and cannot be fumigated easily. However, in the commercial corn-growing area of the North Central States, insects in cribbed corn are not an important problem except in years when the Angoumois grain moth is prevalent in the southern portions of Indiana, Illinois, and Missouri. Crib storage has therefore been reasonably successful and is a firmly established practice in this area.

In the central part of the Corn Belt, corn will normally have 18 to 20 percent of moisture in the kernels and about 35 percent of moisture in the cobs when harvested late in October or early in November. Ordinarily, the corn dries very little in the crib during winter. There may even be a slight increase in moisture in the kernels because of movement of moisture from cobs to kernels or because of snow blown into the crib. Drying takes place as the weather warms up in spring. By May or June, under normal weather conditions, the moisture content of the kernels will be down to about 13 percent, and the grain will be dry enough to shell and store in a tight bin.

[1] Information in this bulletin applies primarily to the commercial corn-producing areas in the North Central States. For information applying to other areas where climatic conditions differ, the grower should consult his State agricultural college.

In some emergencies it may be necessary to store corn in a crib longer than a year, but generally this is not a good practice. If corn is to be stored into the second year, it should be shelled and stored in a weathertight bin wherever possible. The best time to shell is just as soon as the corn has dried to a 13-percent moisture content. Corn will not stay this dry in a crib in humid weather.

PRECAUTIONS IN STORING EAR CORN

Good judgment is necessary in selecting the time to harvest corn for ordinary crib storage. If a mechanical picker is used, it is well to finish harvesting before the cornstalks have been weakened by weathering and before bad weather sets in. Corn dries faster in the field than in the ordinary crib, however, and unless mechanical ventilation is to be used, losses caused by delay in harvesting may be more than offset by spoilage of corn that is too damp for cribbing.

Clean husking is important. Shelled corn, chaff, husks, and silks mixed with ear corn tend to fill the air spaces between the ears (fig. 1), thus cutting off air movement and preventing proper drying of corn in the crib.

Figure 1.—Accumulations of trash and damaged corn that result from poor distribution during the filling of a crib cut off air circulation and prevent proper drying of the corn.

Immature, or soft, corn generally is not of a desirable quality for longtime storage in naturally ventilated cribs. However, if the quality is good except for excessive moisture, soft corn can be brought to good condition by mechanical ventilation, or, in some cases, by using crib ventilators (see p. 17).

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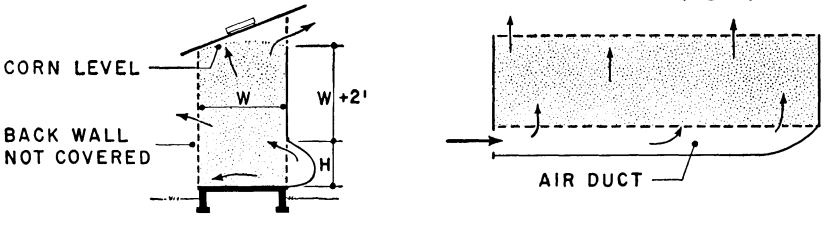
DRYING BY MECHANICAL VENTILATION

Mechanical ventilation permits harvesting corn as soon as it is mature, that is, when the kernel moisture content has fallen below 35 percent. It therefore enables the grower to avoid the hazards of bad weather during late harvests. Even with mechanical ventilation, however, it is usually desirable to delay harvest during good drying weather and while the corn is standing up well.

Drying may be done either with rather simple mechanical systems supplying unheated air or with more complex systems supplying heated air.

Unheated air drying is dependent on weather conditions, but there is no expense for fuel and the initial equipment cost is relatively low. Equipment needed includes a power-driven fan and a crib or drying bin with an air-duct arrangement that will provide for reasonably uniform circulation of air throughout the batch of corn (fig. 2).



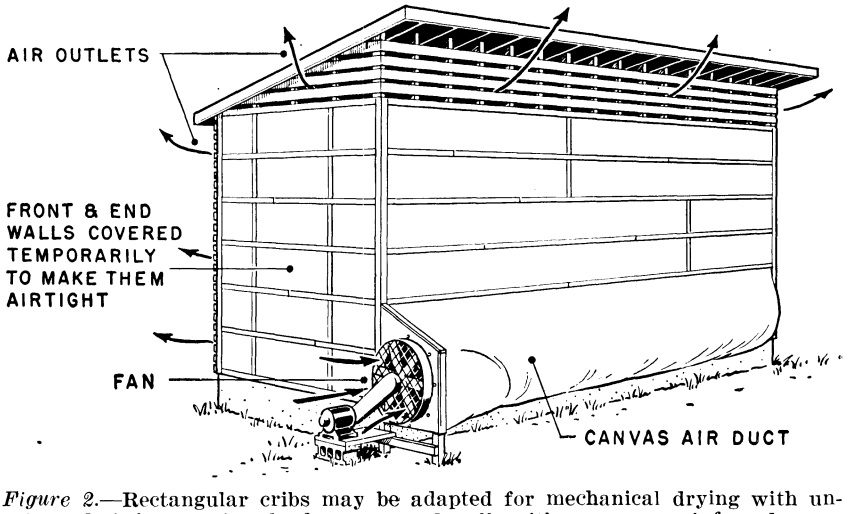


Figure 2.—Rectangular cribs may be adapted for mechanical drying with unheated air by covering the front and end walls with canvas or reinforced paper and adding a temporary air duct. Direction of airflow and recommended dimensions are shown in the small diagrams.

Ear corn with a kernel moisture content as high as 30 percent can be dried successfully with mechanically circulated unheated air in the Corn Belt or in other areas with similar climate. Drying can

be done most rapidly during early fall before the weather becomes cool. If weather conditions are normal after early harvest, the corn will dry from 30 percent moisture content down to 20 percent in from 3 to 6 weeks of continuous ventilation. It will then be dry enough to store through cold weather. If further drying is necessary it can be done as the weather warms up in the spring.

Drying systems using heated air make it possible to dry ear corn

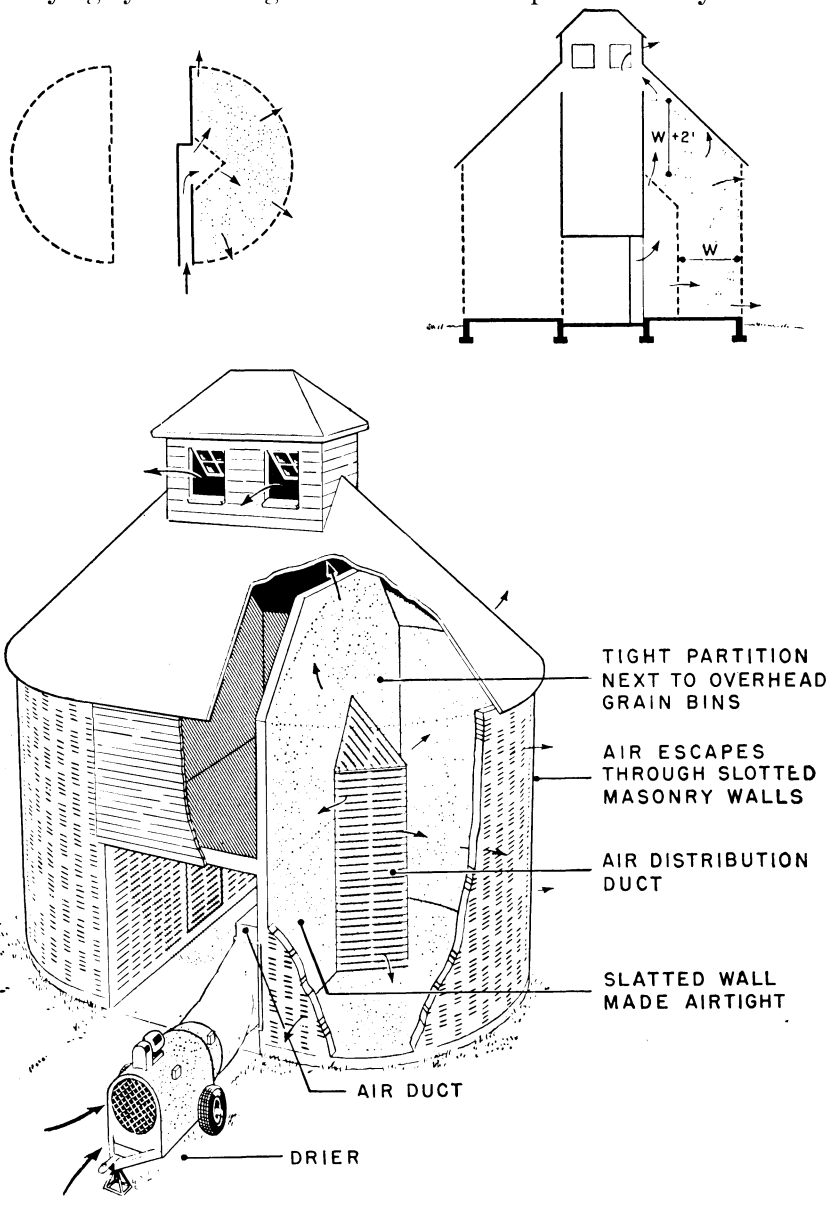


Figure 3.—This schematic diagram shows the method of drying ear corn in an oval masonry crib with a portable hot-air drier. Arrows indicate the direction of airflow through the crib.

in any kind of weather and at any moisture content at which the corn may be harvested (fig. 3). However, the higher initial cost and the expense for fuel make such equipment more expensive than driers supplying unheated air.

Several makes of portable hot-air crop driers are now on the market. Each drier consists of a power-driven fan, a heater, and suitable safety controls, all assembled as a unit and mounted on skids or a rubber-tired trailer for convenient transportation. The heater may burn oil, natural gas, liquefied petroleum (LP) gas, or coal. The drier is connected to a crib or drying bin in a manner that will provide uniform distribution of air throughout the batch of corn.

CRIB LOCATION

The crib should be located in the farmstead not only for convenience but also for protection of the corn against theft. It should not, however, be closely wind-sheltered by other buildings or trees unless it is to be mechanically ventilated. Locating the crib close to another building or windbreak may reduce the amount of natural ventilation and be responsible for damage of the stored corn. A distance of 50 feet or more from other buildings also helps to minimize fire hazard.

A crib can be built in or as a part of a barn or other livestock shelter if it is desired only as a storage place for corn that will be fed during winter months. A crib so located will not have good enough natural ventilation to condition corn for summer storage. Furthermore, moisture given off by livestock is likely to cause corn moisture to increase during the winter.

Good drainage away from all sides of a crib is desirable. However, steep slopes are generally objectionable because of inconvenience in driving to and from the building, higher cost of foundations, and the possibility of foundations being undermined. No crib should be built on river or creek-bottom land subject to flooding unless it is on a high foundation.

Location of a crib in a barn lot where livestock come in contact with the building generally is not desirable; but a concrete feeding floor for hogs along a sheltered side of the crib may be desirable on some farms.

CRIB REQUIREMENTS

Corncribs are made in a wide variety of designs and materials. Detailed discussion of all types of construction cannot be included in this bulletin, but the basic service requirements can be stated in general terms. Any crib that meets these requirements will give satisfactory storage for ear corn, whether the building is new or old and whatever the materials used in its construction.

To meet the basic service requirements a crib should:

1. Have adequate strength to hold the corn and resist wind damage and the stresses set up as the corn settles.
2. Provide adequate ventilation for curing of the corn.
3. Protect the corn from soil and surface moisture and from rain and snow.
4. Provide reasonable protection against thieves, rodents, and fire.
5. Be accessible for inspection and sampling. This means that walls should have openings that will admit an ear-corn probe to obtain samples from all parts of the crib.

Other desirable features in corncribs are:

1. Reasonable cost.
2. Convenience of filling and emptying.
3. Suitability for mechanical ventilation.
4. For permanent cribs, durability and low upkeep expense.
5. For temporary cribs, low cost, ease of erection, and portability.

WIDTH OF CRIBS FOR NATURAL VENTILATION

Cribbed ear corn can mold and spoil after the coming of warm weather in the spring if kernel moisture content remains above 13 percent. To reduce kernel moisture from 20 to 13 percent, about 8 pounds (nearly a gallon) of water must be evaporated from each bushel of corn. This can be done only if there is good circulation of air through all parts of the crib.

For naturally ventilated corncribs, the most important dimension is the width. The narrower the crib, the freer the movement of wind through the corn and the greater the likelihood of successful natural drying. The proper width of an ordinary crib in a particular locality depends on the date at which corn normally matures and on prevailing weather conditions during the first 8 months of storage. Among the weather factors that should be considered are humidity, temperature, and amount of sunshine and wind.

Maximum crib widths recommended for naturally ventilated rectangular cribs in the Corn Belt are shown in figure 4. Round

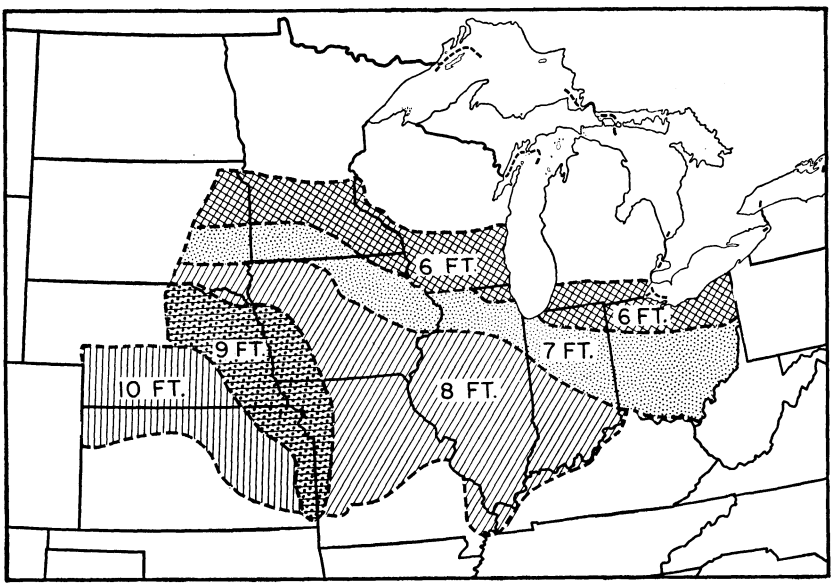


Figure 4.—Maximum widths recommended for naturally ventilated cribs in the commercial corn-growing area.

cribs without interior ventilators should have a diameter not greater than one and one-half times the widths shown. Ear corn will nearly always cure satisfactorily in fully exposed cribs of the dimensions given (1) if its kernel moisture content is not more than 20 percent

when harvested, (2) if it is husked reasonably clean, and (3) if there is no excessive accumulation of shelled corn or foreign material at any place in the crib.

If the kernels contain more than 20 percent of moisture or if the crib is wider than recommended, the corn should be dried mechanically, or one or more ventilating ducts (see p. 17) should be installed.

OPENINGS IN CRIB WALLS

Sizes of openings in crib walls vary greatly depending on types of construction. In picket or snow-fence cribbing, the openings between slats make up about half the surface area. In welded steel mesh, the openings usually form more than 90 percent of the area. In frame crib walls covered with 6-inch beveled cribbing spaced 1 to 1½ inches apart, the openings are 15 to 20 percent of the wall area. Some galvanized steel crib walls have been made in which openings constitute only about 3 percent of the wall area.

Ordinarily an 8- to 10-percent opening is about the least that will give good air movement. Natural ventilation is a little better with greater area of opening, but exposure to rain and snow is also increased. Beveled cribbing gives some protection from rain.

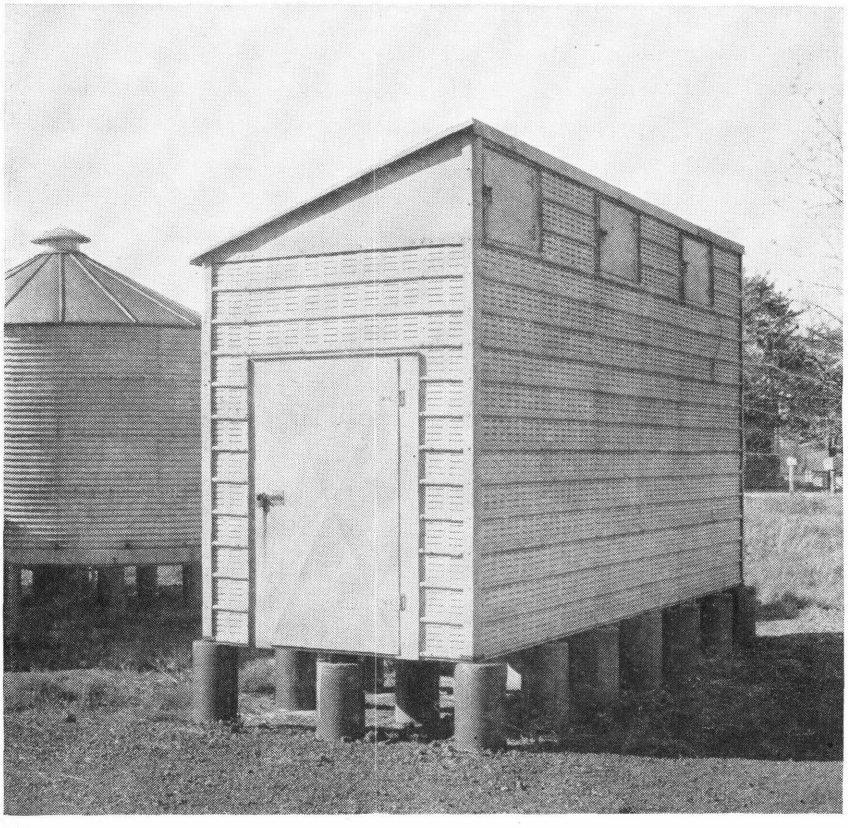


Figure 5.—This ratproof single crib is made of perforated steel panels.

In the northern part of the Corn Belt it is best to make the upper section of the crib as nearly snow tight as possible. This can be done by boarding the walls solidly 2 to 4 feet down from the eaves, thus preventing the snow from drifting over the surface of the corn.

TYPES OF STORAGE STRUCTURES

The strength of a corncrib will depend on use of the proper sizes of joists, studding, ties, and other structural members and on proper joining of all parts of the building. It is therefore advisable to build from a detailed working plan. A list of several typical plans for corncribs, as recommended by the United States Department of Agriculture, and information on where to obtain the plans are given on pages 19 and 20. Plans are also available from other sources. Prefabricated buildings suitable for storage of ear corn are on the market but are not described in this bulletin.

Naturally Ventilated Structures

Rectangular Cribs.—Wood-framed cribs are most easily erected in rectangular shapes. Such construction provides good natural ventilation, especially if the width follows the recommendations given in figure 4. Construction details of typical rectangular cribs are given in plans 73272 to 73283, listed on page 19. Single cribs (fig. 5) permit the best circulation of air because they are fully exposed to wind on all sides.

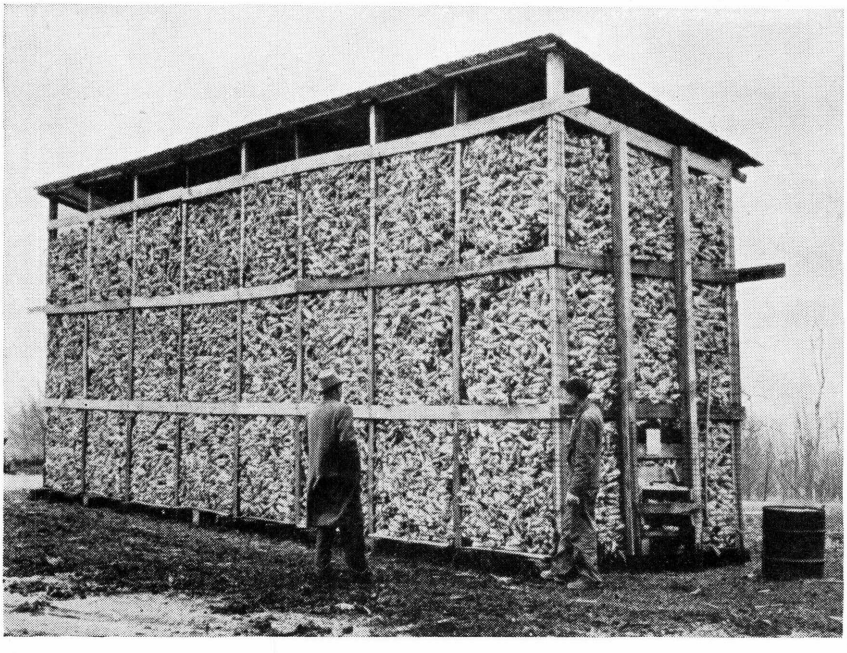


Figure 6.—Semipermanent rectangular cribs can be built at relatively low cost. Although simply constructed, this crib is well exposed to wind, has a good roof, and the floor is set above the ground. Crib should be braced against wind when empty.

Semipermanent single cribs of rectangular shape, as shown in figure 6 or in plan No. 73271, have been used on many farms when it was considered necessary to keep down the first cost of the structure.

These cribs, when in good condition, provide acceptable storage. Usually they do not provide very good protection against rats. The expense of upkeep is likely to be greater than with a more permanent type. It is questionable that the total cost over a long term of years is any less with the semipermanent type of crib.

Ear corn can be effectively dried in double cribs, even though natural ventilation is not quite so good as in single cribs. Permanent double-crib buildings with a driveway (fig. 7) and sometimes with grain bins

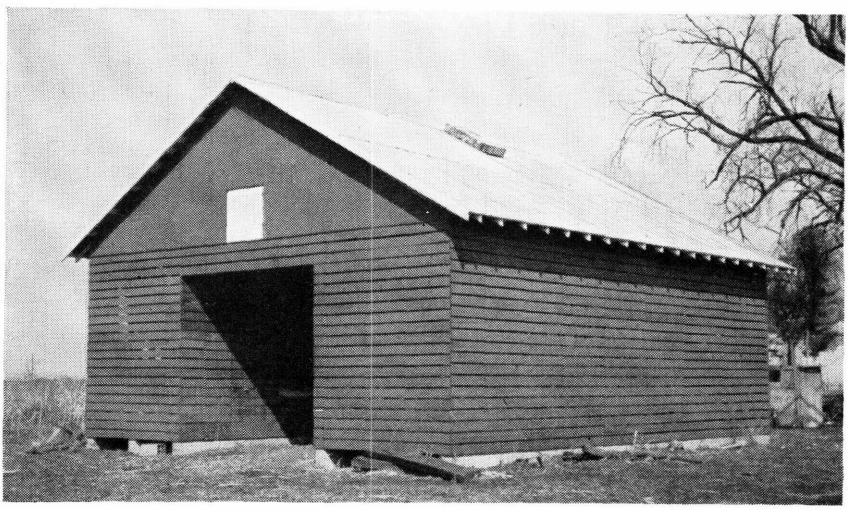


Figure 7.—Double cribs of the design shown above are common in the Corn Belt. Each bay of the crib shown here is 8 feet wide, 36 feet long, and 10 feet high at the eaves. Capacity is about 1,000 bushels of new corn per side.

over the driveway, as shown in plans Nos. 73282 and 73283 (listed on p. 19), are popular in the heaviest producing areas of the Corn Belt. Stationary vertical elevators are sometimes installed in large double-crib buildings with overhead bins (fig. 8).

Round Cribs.—Round cribs made with snow-fence cribbing or with welded-steel cribbing are used extensively for temporary storage in the drier parts of the Corn Belt. A board floor raised 6 to 8 inches above ground surface is generally used. It is difficult to build a good roof for such cribs, and consequently many are used without a roof. When so used, they are low-cost structures that can be erected quickly. However, roofless temporary cribs do not provide safe storage through the summer even in a comparatively dry climate. A single roof may be built over a group of several round, open-mesh cribs, thus making a serviceable semipermanent structure (fig. 9).

Round or curved-wall cribs (fig. 10) of masonry materials, such as open building tile and concrete staves, are in use on many Corn Belt farms. Steel hoops or reinforcing in the mortar joints are used to hold the walls against the pressure of the corn.

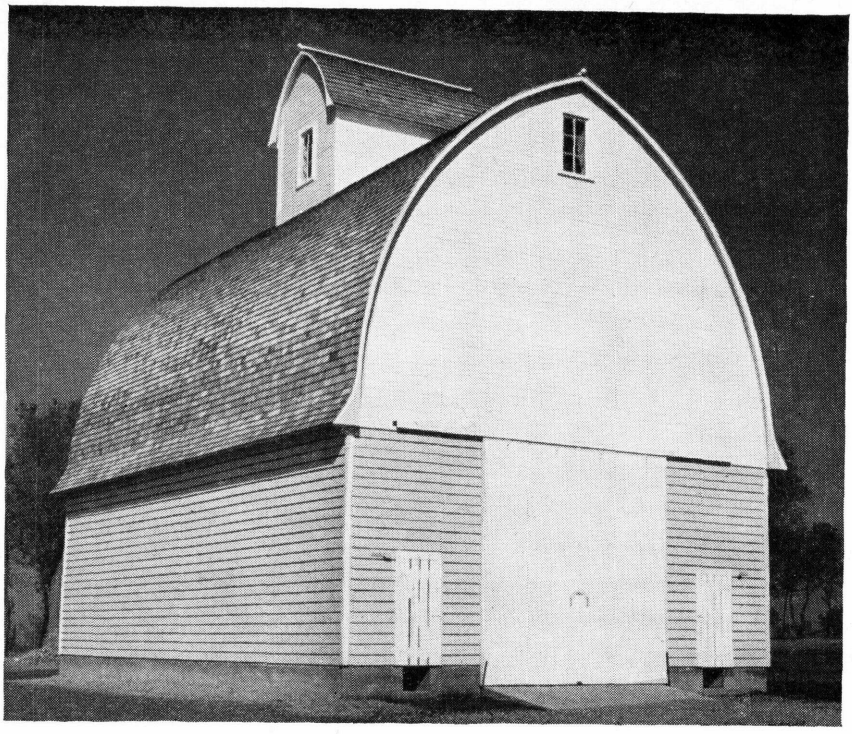


Figure 8.—This double crib has a stationary vertical elevator and storage bins over the driveway. Shelling trenches have been installed under the crib areas.

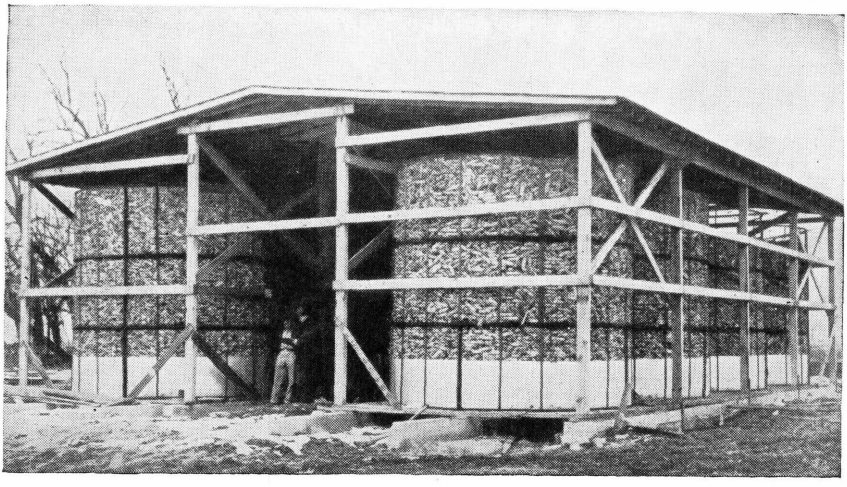


Figure 9.—These round, welded-mesh cribs are protected by a single wood-framed roof. Each crib is 13 feet in diameter and 12 feet high. Capacity of all cribs is about 5,000 bushels.

Figure 10.—This curved-wall concrete-block crib has overhead storage space for shelled corn or small grain. Additional ventilation is often needed in such cribs; it can be provided with interior ventilating flues or with mechanical equipment.

Masonry cribs have the advantages of economy in construction, fire resistance, rat resistance, and permanence, but many provide inadequate natural ventilation. This can be overcome by using mechanical ventilation or properly designed interior ventilators. Care should also be taken in filling to avoid accumulations of shelled corn and debris. An effective means of improving storage results is the use of a deflector to spread shelled corn out near the walls.

Mechanically Ventilated Structures

Most existing permanent- or temporary-type cribs can be adapted for drying with mechanical ventilation at a moderate expense (see figs. 2 and 3). Mechanical ventilation also makes it possible to store ear corn in large buildings that would not otherwise be suitable. The cost of drying equipment is largely offset by more economical construction due to the greater width of building. Figure 11 shows a large semipermanent crib with walls constructed of poles and welded wire. It has a built-in central air duct, for drying with heated or unheated air. The inside of an arched-roof general-purpose building arranged for storing ear corn is shown in figure 12. Satisfactory drying is acomplished by forcing air into the central duct with a large fan (fig. 13).

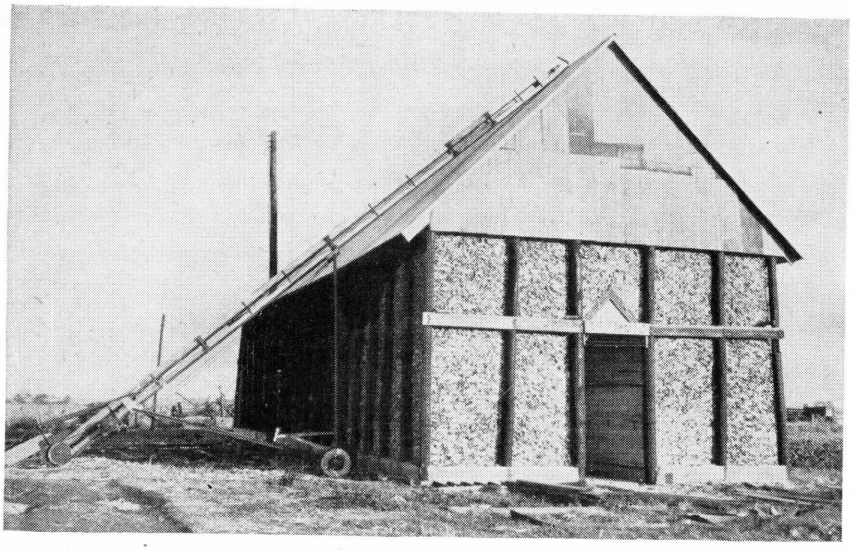


Figure 11.—This semipermanent crib is 90 by 24 feet, 16 feet high at the eaves, and has a capacity of about 16,000 bushels. Note inside doors for emptying corn and adjusting air flow during drying.

Figure 12.—Interior view of a general-purpose farm building arranged for drying and storage of ear corn. Dimensions of the building are 32 by 48 feet, and the capacity is about 6,000 bushels. The air duct shown at the lower left is removable.

Figure 13.—Exterior view of general-purpose building used for storage of ear corn, showing the connection of the fan to the interior ventilating duct.

Wood-framed buildings may also be provided with a fan and duct system for mechanical drying of ear corn. A typical arrangement is shown in plan No. 75513, listed on page 19.

Several other arrangements may be used for ventilating cribs mechanically. Ducts or perforated floors are often installed in either round or rectangular buildings. The large steel cribs shown in figure 14 have perforated walls and central air ducts for mechanical ventilation. In all buildings where mechanical ventilation is used, large doors or other openings must be provided for escape of air.

CRIB CONSTRUCTION

Foundations

The crib foundation should have footings large enough to prevent damage to the building by uneven settling. On most soils, footings should have a bearing of 1 square foot on the ground for each 40 bushels of ear corn or each 50 bushels of shelled corn or wheat. Where concrete floors are laid on the ground, footings can be made smaller.

For a masonry building, the foundation walls should go down below the depth to which the ground freezes, to prevent cracking of walls by frost heaving. Wood-framed or steel cribs are usually flexible enough to stand any ordinary amount of distortion caused by such heaving. For permanent frame cribs, the foundation should

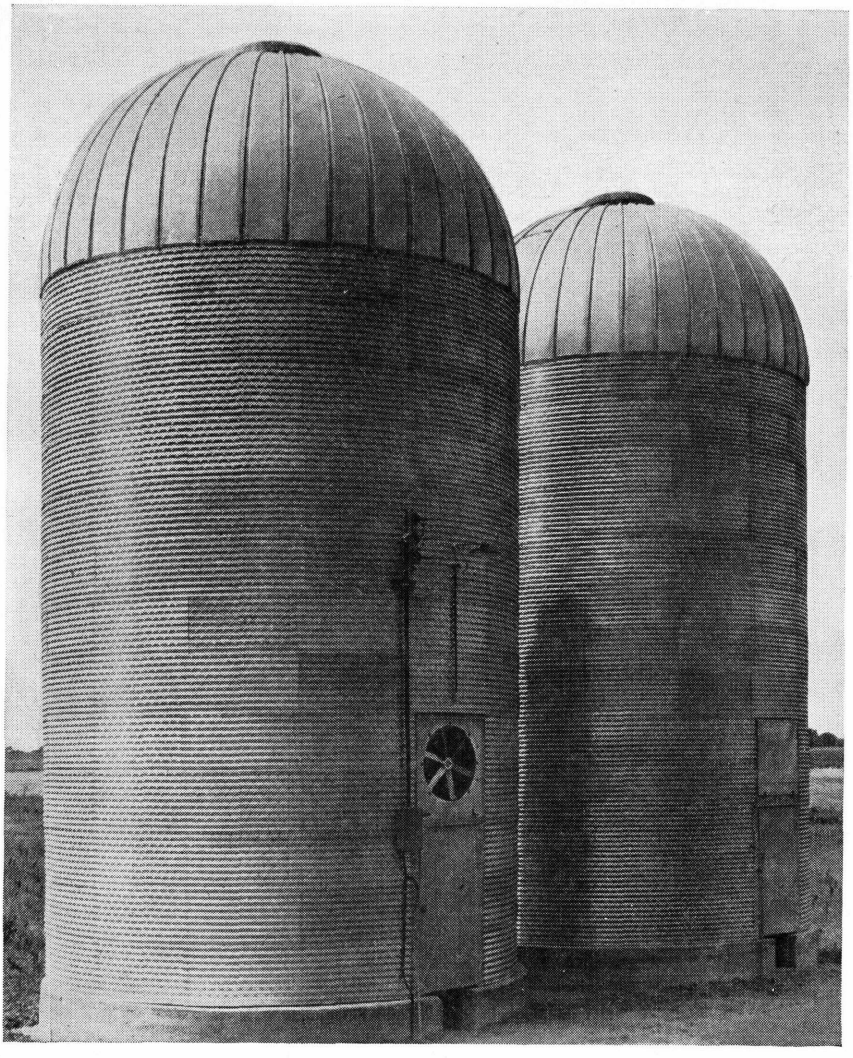


Figure 14.—These prefabricated round cribs are provided with perforated walls and central air ducts for forced ventilation.

go down at least 18 inches below ground surface. This minimum should be used only where no soil will wash away from the foundation.

Foundations should extend far enough above ground to protect wood from moisture and to discourage rats from working under the floor. If a wood floor is used, the lower edge of the joists should be at least 12 inches above the ground—15 to 18 inches is more desirable. Permanent foundations should be built of masonry, preferably concrete. In a continuous foundation wall, two ⅜-inch or ½-inch reinforcing bars, one near the bottom and one near the top, add considerably to the strength and aid in preventing cracking of the concrete.

Foundations of concrete blocks 2 courses high or other materials of equal strength and permanence can be used for temporary cribs. If the blocks are of good enough quality to withstand dampness and frost action and if enough of them are used to give adequate bearing surface on the soil, such foundations will give good service. Nine 8- by 16-inch blocks laid with cores horizontal give 8 square feet of bearing surface.

Empty wood or metal cribs are not heavy enough to withstand windstorms unless they are firmly anchored to the ground. If the crib is supported on a concrete foundation, bolts should be cast in the concrete in order that sills can be bolted to the foundation. If a semipermanent or temporary block foundation is used, the crib should be anchored with heavy wires to at least four "deadmen" in the ground or with posts set solidly beside the wall.

Flooring

Crib flooring is most commonly made of wood or concrete. Wood floors may be made of plain boards or of tongue-and-groove flooring. The cracks between plain boards serve to drain any water that enters through crib walls, but they are a disadvantage in mechanical drying because they allow leakage of air. All wood floors must be supported well above the ground to permit air circulation underneath and to be safe from damage by rats.

Concrete floors, if properly drained, have proved satisfactory for corncribs. The floor surface should be at least 8 inches above the ground on a well-drained site. The floors should slope about one-fourth inch per foot toward the outside walls, and drainage should be provided under the sill (fig. 15). This construction is necessary for disposal of water that may enter through the crib wall during a storm. The fill under a concrete floor may be of well-compacted earth instead of gravel (1) if the floor is raised at least 8 inches above the ground on all sides, (2) if the floor is properly drained, and (3) if a vapor barrier of 55-pound roll roofing or equivalent is used.

To accommodate shelling trenches of ordinary design, crib floors should be 2 feet above ground level. The additional height adds considerably to the cost of the foundation and floor. In deciding whether to install shelling trenches, the extra cost should be balanced against possible gains in efficiency and saving of labor. A shelling trench will save some labor in cribs wider than 8 feet. In cribs narrower than 8 feet the labor saving is not great, considering the work of cleaning out the trench at the end of the shelling operation.

Wall Framing and Bracing

Crib walls are subjected to heavy pressures, both lateral and vertical. The vertical loads are caused by friction of corn on the walls and by the weight carried on cross braces as the corn dries and settles. Breakage of cross ties and braces has been the most common failure in corncribs. A cross brace made of three 1- by 12-inch boards is shown in figure 16. A 1- by 12-inch board will carry more vertical load than a 2- by 6-inch plank, and because it is wider and thinner, can be nailed to the studs more securely.

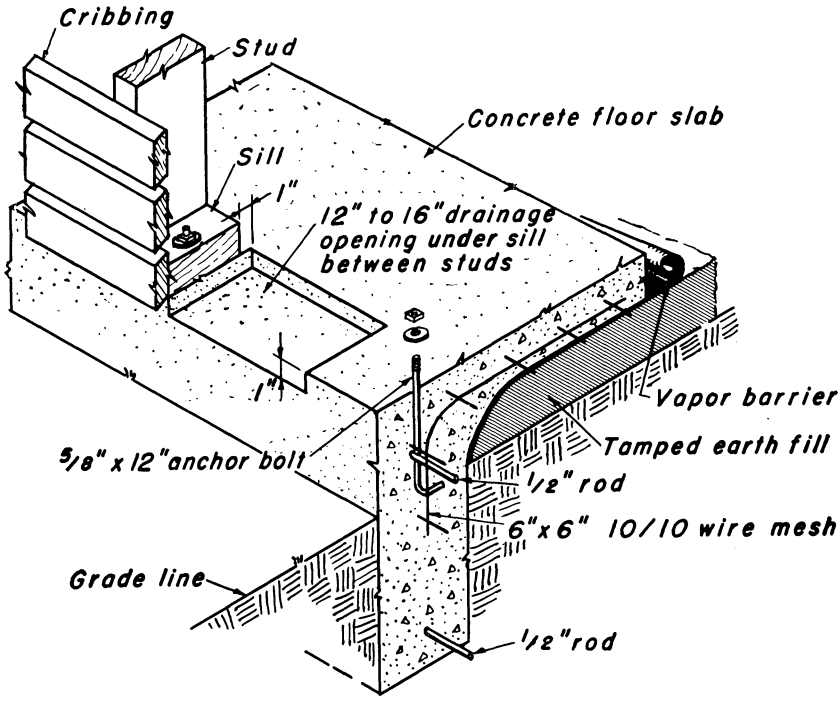


Figure 15.—Construction details of a concrete floor for a corncrib. Note anchor bolts, drainage openings under the sill between each pair of studs, and the composition roofing placed below the floor for a vapor barrier.

If mechanical ventilation is to be used in a crib, elimination of interior cross bracing by use of stronger studs is desirable. Details of construction showing the means by which a building can be made strong without cross bracing are given in crib plans Nos. 73272 to 73283, listed on page 19.

Roofs

A good roof is essential for storing corn safely. Roofs made of boards with battened joints have been used on some temporary cribs. In a comparatively dry climate, slight leakage through such a roof may cause little if any damage, but this type of construction is not recommended. Wood shingles make a satisfactory roof, and corrugated galvanized steel or aluminum roofing make good roofs if securely nailed.

Roll roofing, as usually applied, is not satisfactory because it can be torn or damaged by winds. An exception is "wide selvage" asphalt roofing which gives double coverage and makes a good roof when nailed and cemented according to the manufacturer's instructions. Rectangular or "American" pattern asphalt shingles are subject to wind damage. For increased wind resistance, however, the exposure of the shingles can be reduced to 4 inches, or better still a 1-inch dab of roofing cement can be put under each shingle tab. "Lock tab" asphalt shingles are more resistant to wind damage than other types.

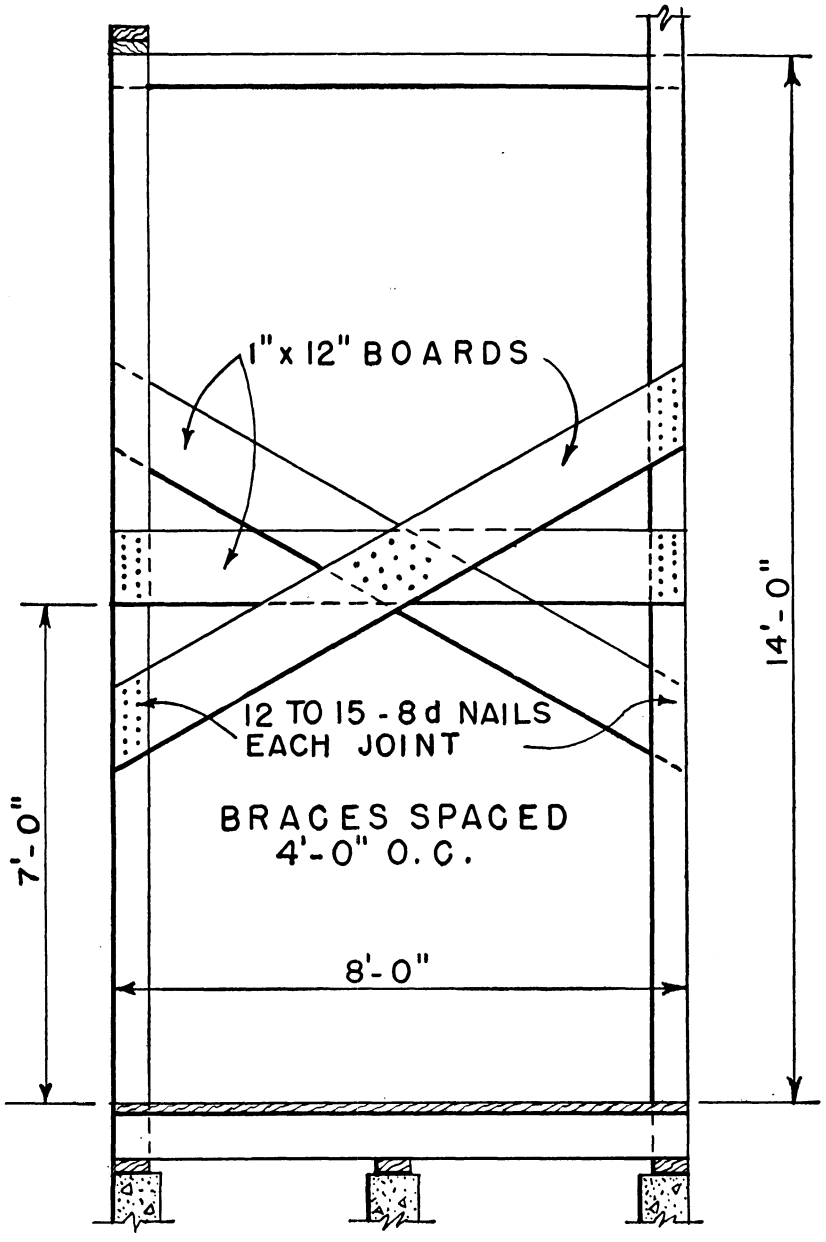


Figure 16.—Cross braces formed of three 1- by 12-inch boards will withstand heavy vertical loads of corn as it settles in the crib. Joints can be nailed with eightpenny nails.

Crib Ventilators

If corn has more than the safe limit of moisture or if the crib is wider than recommended in figure 4, some type of interior ventilator should be installed to provide adequate natural ventilation. Two

types of ventilators that have been effective are shown in figure 17. When installed on the center line from end to end of a crib, they divide it into two narrow sections. If necessary, the ventilator shown in figure 17, *B*, may be installed crosswise of the crib. The ventilators are effective only up to a little above their height. They can be built in sections small enough for easy removal as the crib is emptied. If readymade ventilating tubes are used, they should be spaced closely enough to admit about the same amount of air as the ventilators shown in figure 17.

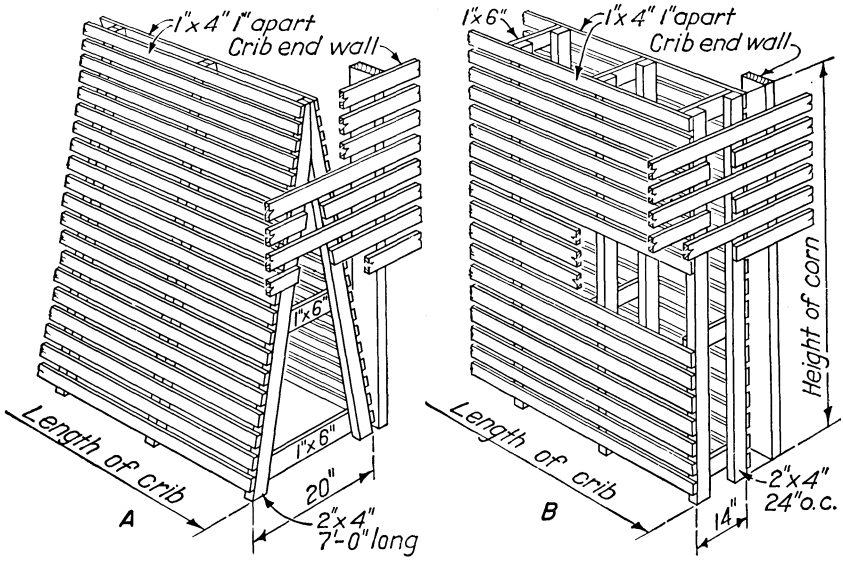


Figure 17.—Types of corncrib ventilators: *A*, A-frame ventilator, usually installed lengthwise in the crib; *B*, vertical-sided ventilator, which may be installed lengthwise or crosswise.

Observations have shown that vertical flue-type ventilators are less effective than horizontal ducts in corncribs. It is wind pressure that forces air through a crib. The air path through the ventilator should therefore be horizontal and the ends of the ventilator should be exposed to outside air.

EQUIPMENT FOR HANDLING CORN

Two types of elevators for handling ear corn are in general use on Corn Belt farms. One type—the stationary vertical elevator—is permanently installed in double-crib buildings (figs. 8 and 10). Such installations are practical only when there is a cupola large enough to house the elevator head. These elevators have the advantage of being able to convey material to any height in the building. The second type—the portable inclined elevator (fig. 11)—is the one most commonly used in the Corn Belt. It can be used to fill double cribs up to 25 or 30 feet in height (fig. 7), single cribs of various designs (figs. 5 and 6), or grain bins. Both types of elevators can also handle shelled corn or threshed small grain.

An elevator generally drops the corn in one place. To avoid accumulations of shelled corn and foreign material under the spout the corn should be spread by dropping it onto a deflector or by moving the spout frequently. Elevators should also be equipped with screens to take out as much shelled corn and trash as possible.

For convenience in emptying, a crib may be provided with a shelling trench or a shelling door just above the floor along one side of the crib. As the corn rolls out of these openings, it can be removed by a sheller conveyor, or "drag," and carried to the sheller.

RODENT AND BIRD CONTROL

Rats, mice, and birds frequently cause severe losses to corn stored in cribs, particularly when it is held in storage over a prolonged period of time. In addition to the quantities consumed by rodents and birds, much of the corn may also be contaminated by droppings, urine, hair, or feathers. Such corn is not only unfit for human consumption, but its nutritional value and acceptability as feed for livestock are greatly reduced. For these reasons, it is important that rodents and birds be excluded from storage buildings. Detailed information on methods for controlling rodents is contained in two of the publications listed at the end of this bulletin.

INSECT CONTROL

As previously noted, the Angoumois grain moth is the most serious insect pest attacking cribbed corn in the Corn Belt. It becomes active in the late spring in the southern portions of Indiana, Illinois, and Missouri. When such activity is noted the corn should be shelled and binned. Moths emerging from infested kernels in bins are mostly killed in attempting to work their way to the top, and further infestations are usually limited to the surface layer. Such infestations can be controlled by spraying the surface with oil at the rate of 2 quarts per 100 square feet of surface. Use a refined white oil of 100 to 200 seconds viscosity (Saybolt) at 100° F. It should be free from objectionable odor. Oils of this kind are readily available from most oil companies.

PLANS FOR STORAGE BUILDINGS

The following plans for storage buildings have been prepared by the United States Department of Agriculture in cooperation with State agricultural experiment stations of the North Central States:

Storage Buildings

Midwest Plan No.	
73271	Pole crib, semipermanent.
73272	Single wood crib.
73281	Double wood crib with 4-foot alleyway.
73282	Double wood crib with driveway.
73283	Double wood crib with driveway and overhead bins.

Drying-Storage Buildings

75503	Steel bin with perforated floor.
75513	Gable-roof building (convertible to hay or machinery storage).
77416	Movable drying, storage, and self-feeder for cattle.
77615	Movable drying, storage, and self-feeder for hogs.

An illustrated catalog entitled, "Grain Storage Building Plans," is issued by the Midwest Plan Service, which is sponsored by the State agricultural colleges of the North Central States and the United States Department of Agriculture. The catalog shows the finished appearance of the buildings listed. It may be seen at many county agricultural agents' and material dealers' offices or purchased from the agricultural extension service of any of the State colleges in the North Central Region for 25 cents. Detailed working plans may be obtained for a small charge through the State extension agricultural engineer. In some States these drawings may be obtained only through county agents. Plans should not be ordered from the United States Department of Agriculture, as they are available only from the States.

Additional Information

Below is a list of publications issued by the Federal Government that give details on storing and drying ear corn not covered in this bulletin. Single copies of those publications without a sales price may be obtained by writing the Office of Information, United States Department of Agriculture, Washington 25, D. C. Those publications showing a sales price can only be obtained by writing the Superintendent of Documents, Government Printing Office, Washington 25, D. C., and enclosing a check or money order made payable to the Superintendent of Documents.

Farmers' Bulletin 1260	Stored Grain Pests.
Farmers' Bulletin 1976	Handling and Storing Soft Corn on the Farm.
Farmers' Bulletin 2009	Storage of Small Grains and Shelled Corn on the Farm.
Farmers' Bulletin 2071	You Can Store Grain Safely on the Farm.
Leaflet 333	Drying Ear Corn with Heated Air.
Leaflet 334	Drying Ear Corn with Unheated Air.
Conservation Bulletin 19	Ratproofing Buildings and Premises, 10 cents.
Circular 22	Rats—Let's Get Rid of Them, 10 cents.

Additional information on storing ear corn on the farm is available through your State agricultural extension service and your county agent.

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